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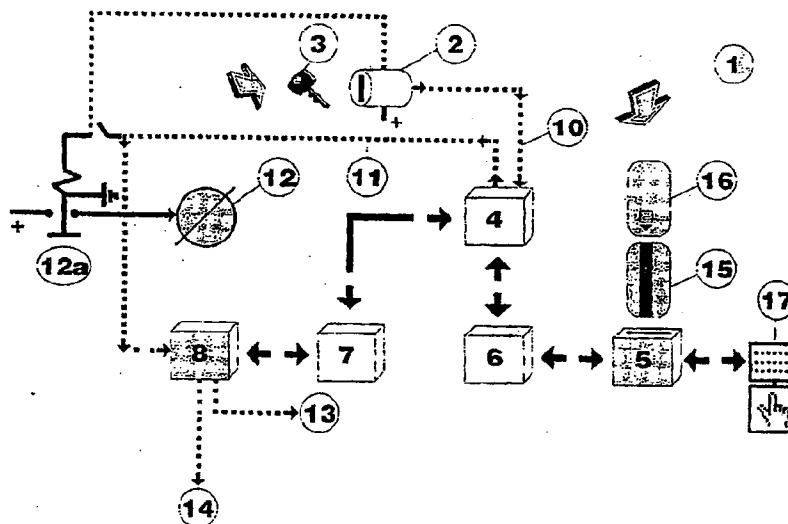
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(54) Title: THEFT-IMPAIRING DEVICE



(57) Abstract

The invention comprises a theft-impairing device (1), intended for a motor vehicle, which utilizes an ignition lock (2, 3), a control device (4) and a code identification unit (5). A through-voltage connected via the ignition lock (2, 3) can be supplied (10) to the control unit (4), which is so arranged, given the fulfilment of certain selected conditions, to supply voltage to at least a starter motor and a drive unit (8), belonging to a fuel and/or ignition system (13, 14) for the engine. One of these conditions is that the control unit (4) has received and approved a signal generated by the code identification unit (5). The drive unit (8) belonging to the fuel and/or ignition system is connected to the control unit (4) in order, depending on an activation signal generated in the control unit (4), to allow voltage to be supplied for the activation of functions in the drive unit (8), whereby another of the conditions mentioned is that the control unit (4) has received and approved an acknowledgement that the activation signal mentioned has activated functions inside the drive unit (8).

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**DESIGNATION OF INVENTION:**

Theft-impairing device

**Technical field**

The invention in question is in general related to a theft-impairing device and more specifically to the type of theft-impairing device that is intended to be used to impair the theft of motor vehicles such as cars, boats and the like.

For an expert in the field, it is easy to see the practical applications that a device of this kind offers, and within which technical fields it can be used.

For the purpose of simplification, reference will only be made in the following text to motor vehicles.

More specifically, the invention in question is related to the kind of theft-impairing devices for motor vehicles which, in order to function, make use of signals received from an ignition lock, a computer-equipped control unit and a code and/or card identification unit.

**Background art**

Theft-impairing devices, intended to be installed in motor vehicles, are previously known in a number of embodiments.

If the basic preconditions of the present invention are considered, it may be noted that a main group of such devices use signal information received from an ignition lock installed in the motor vehicle, a signal-processing computer-controlled control unit and signal information received from a code and/or card identification unit.

The signal information from the ignition lock is registered by the control unit as an indication that the engine shall be started, and the control unit evaluates whether all the other selected conditions for being able to transmit a start signal are fulfilled. If the conditions are not fulfilled, no start signal is transmitted, and the engine cannot be started.

As an example of the background art, reference is made to what is previously known from International Patent Application-PCT/SE87/00545, Specification No. WO88/03884, where a theft prevention device for motor vehicles is shown and described, and which for this purpose utilizes a computer-equipped control unit which is adapted to produce the requisite control signals.

The theft prevention device operates in this context with different codes and incorporates a code bearer, integrated with the ignition key, a code reader and a code-comparing circuit, which either accepts or rejects the code carried by the code bearer. The code-comparing circuit is integrated in the control unit so that different control signals, addressed to different operative units, are only generated if the code received is correct.

In the specification referred to above, it is stated that the output signals generated in the control unit, which control the ignition, fuel injection, fuel pump, etc., normally have to pass through an amplifier or some other organ suitable for the processing of output signals, in order to have an influence on the organ selected.

In the specification referred to, it is further stated that the control system and control unit are activated by means of a start signal that is received when the ignition key is turned to an activating position in the ignition lock.

US Patent Specification 4,805,722 discloses a theft prevention device for motor vehicles based on the use of a magnetically or optically-coded card that can be inserted in a card reader installed in the vehicle and intended to restrict the use of the vehicle.

Here it is proposed that the vehicle should have an identification number which is stored in the control unit, together with continuous updating of date and time.

If the identity of the vehicle on the card and the code stored in the control unit concur, and if the date and time fall within the authorized range registered on the card, the vehicle can be used.

If a comparison indicates that the card cannot be used, the ignition system and fuel line in the car will be blocked, at the same time as the engine bonnet is locked, in order to make the vehicle more difficult to steal.

Should the driver accidentally leave the card in the card reader when leaving the vehicle, the vehicle ignition will continue to function until the card is removed, which will serve to remind the driver to remove the card from the card reader.

US Patent Specification 4,884,207 discloses a start control device for an engine, installed in a vehicle, by specifying a start control unit, which incorporates a fuel supply organ, with which to supply the engine with fuel, and an electric drive in order to supply current to a fuel-receiving unit and a control device, for the purpose of storing a specific code and comparing an input code with the specific code in order thereby to determine concurrence and provide an indication to the driver when both concur. Then the motor can be started, but if the codes do not concur the fuel supply is blocked.

A computer-controlled theft prevention device for motor vehicles based on the use of a computer system is previously known from German Patent Specification 35 44 934. It specifies a manually-controlled activating switch to activate the system, and a memory that controls a releasing device.

US Patent Specification 4,477,874 discloses a code and/or card-controlled system for controlling a vehicle.

The engine of the vehicle can be put into preparatory operational status pending the receipt of an engine-starting code, which is stored on the card as a safety measure.

US Patent Application 4,777,377 discloses a theft prevention system that is activated either by a key switch or by a magnetically coded card and appurtenant card reader inside the vehicle, in order to move a solenoid valve to a position that renders the vehicle impossible to use, through the effect of a hydraulic braking system, and which prevents operation of the vehicle or, in an opposite position, makes the vehicle possible to operate.

This system requires a specified voltage, acting on a level higher than the voltage level of the vehicle battery, in order thereby to prevent hot-wiring of the system.

European Patent Specification 0 392 411 discloses a control system for a motor vehicle, utilizing a control unit, which activates and controls functions in different units, in order thereby to control and operate different parts and accessories installed in the vehicle.

The control unit is connected for use in conjunction with a card unit, into which a card is inserted. The card in question has one identification code for a user and one identification code indicating that the card has been registered in advance.

The control system contains a list of identification codes for those cards authorized for use in the system, and if a card is inserted, and confirmed as being correct and valid through identification of the registration code, the control unit will generate a predetermined operating signal and then generate a go-ahead signal. On receipt of this go-ahead signal, the control units can be initiated.

UK Patent Specification 2 251 503 discloses a security system for vehicles, based on a central computer-equipped control unit, which is in computer communication with checking units acting on the parts of the equipment to be protected.

The control unit accepts a code from the memory, for an ignition key belonging to the vehicle in question, changes the code and transmits the changed code back to the central control unit in order then to check and control the equipment in the vehicle.

A protection system for vehicles is previously known from European Patent Specification 0 456 916, whereby the system prevents the function of the engine and stores data referring to the maintenance of the vehicle.

The system utilizes a smart card, a reader, a printer, which is connected to a central control unit and which is in turn connected to a RAM memory and a ROM memory, and to a control and input/output sockets, to which a number of sensors are connected.

The functional program included in the RAM memory is incomplete and is complemented with the aid of information carried on the smart card prior to the entry of a personal identification number.

The information, corresponding to data on or specific details concerning the vehicle, is stored on the card with the aid of terminals installed at service stations and which are connected to a data processing centre via a communications network in order thereby to read data relating to the vehicle.

International Patent Specification PCT/DE84/00053, publishing number WO84/03785, discloses a control unit for motor vehicles, which contains an identification card, provided with programmable information, for example a coded magnetic tape.

If the identification card is inserted in the device, selected operating data on the vehicle is controlled and set up. This can be done, for example, by activating an electrical device, such as the starting of the engine, activation or de-activation of the hand-brake and steering, etc.

Furthermore, it is possible, via the identification card or by programming, by means of a set of push-buttons, to limit the function of the vehicle, for example by specifying a specific maximum fuel consumption, limiting the maximum acceleration, etc., each of which shall have an influence on the condition of the vehicle.

If consideration is given to the significant properties of the invention, it can be mentioned that for the operation of engines, the use of a computer-equipped control unit is previously known which, depending on the engine speed, required power output and other criteria, controls a fuel-injection and ignition-setting unit.

A unit of this kind, for fuel injection and ignition setting, requires a power supply for its operation and is referred to, in the subsequent specification, as the drive unit.

## PRESENTATION OF THE CURRENT INVENTION

### Technical problems

With due consideration to the background art, as described above, it would appear to be a technical problem, in connection with a theft-impairing device intended for a motor vehicle employing an ignition lock, a computer-equipped control unit and a code and/or card identification unit, to be able to create the preconditions necessary for a voltage, connected via the ignition lock, to be supplied directly to the control unit and which in turn is arranged to supply indirectly at least a starter motor with voltage and indirectly supply the output signals for the drive unit with voltage.

It is in this context a technical problem to be able to recognize the advantages of allowing the specified drive unit to be supplied with voltage indirectly and to utilize the initiating and acknowledgement signals from the drive unit in the control unit.

It is also a technical problem to be able to recognize the importance of being able, via a control unit, to generate the required voltage feed to the fuel system and/or ignition system and, via the control unit mentioned, generate and receive control signals monitoring functions in the drive unit belonging to the fuel and/or ignition systems.

It must also be regarded as being a technical problem to realize the importance of allowing the drive unit belonging to the fuel and/or ignition systems to be connected to the control unit mentioned in order, depending on an activation and control signal generated in the control unit, to allow an indirect voltage to be fed to the fuel and/or ignition system.

It must be regarded as being a technical problem to realize the importance of checking and permitting voltage to be fed to the drive unit only during the effective duration of an activation signal generated by the control unit.

It is also a technical problem to be able to appreciate the technical advantages associated with a function which means that the removal of a code identification card from a code identification unit shall immediately inhibit the activating signal mentioned and inactivate the functions generated by the drive unit and applicable to the fuel and/or ignition system.



Being able to appreciate the advantages associated with allowing the requisite direct voltage feed to the drive unit and an indirect voltage feed to the fuel and/or ignition system and necessary activation signal to the drive unit to be generated in one and the same unit must also be regarded as a technical problem.

### **Solution**

In order to be able to solve one or several of the above technical problems, the invention in question is based on a theft-impairing device intended for a motor vehicle in which the device uses a voltage feed from an ignition lock, a computer-based control unit for control and checking of different functions inside the vehicle and, above all, theft-impairing functions and a code and/or card identification unit, in order to evaluate an identification stored on a card, in the form of a code.

For a theft-impairing device of this type, the current invention specifies that a voltage, through-connected via the ignition lock, shall be directly feedable to the control unit, which is so arranged, when selected conditions are met, to supply voltage to at least a starter motor, indirectly, and a drive unit, indirectly; adapted to generate the necessary control signals to operate a fuel and/or ignition system for the engine. One of these conditions is that the control unit specified has received and approved a signal generated by the code identification unit.

The drive unit belonging to the fuel and/or ignition system mentioned is connected to the control unit mentioned in order, depending on the presence of a control and activating signal generated in the control unit, to permit the requisite indirect voltage supply for activation of the functions inside the drive unit.

Another condition is that the control unit has not only initiated the transmission of an activating signal but that it has also received and approved an acknowledgement that the activation signal mentioned has influenced the drive unit mentioned to the extent intended.

As proposed forms of execution, falling within the framework of the invention concept, it is specified that voltage to the drive unit shall only be supplied for the effective duration of the activation signal.

It is specifically observed that the removal from or loss of an identification code from the code identification unit shall immediately inhibit the generation of activation signals.

It has been shown to be especially suitable to permit the required voltage supply to the drive unit and a necessary activation signal for correct function of the drive unit to be generated in the control unit.

In this way it is shown that a specified acknowledgement or a generated acknowledgement signal, generated by the drive unit and transmitted to the control unit, represents the status of how the specified activation signal from the control unit has influenced selected functions within the drive unit and which can be verified in the control unit.

### **Advantages**

Those advantages that can primarily be regarded as being characteristic of a theft-impairing device in line with the current invention are that the preconditions have been created for being able to make it possible, within one and the same computer-equipped control unit, to through-connect a current feed to a drive unit for the vehicle, where the drive unit belongs to the engine's fuel and/or ignition system, and to be able to generate an activating signal, stemming from a code identification unit, when it interacts with a card showing the correct identification code.

.....

Those features that can be primarily regarded as the main characteristics of a device in accordance with the invention in question are specified in the following characteristic part of Patent Claim 1.

.....

**Brief description of figures**

A currently proposed form of execution, displaying the significant characteristics of the present invention, will now be described with reference to the attached drawings where:

Figure 1 shows schematically the parts included in a vehicle in order to make use of a theft prevention device, in accordance with the present invention,

Figure 2 shows the basic structure of required functions in a typical and computer-equipped control unit for the invention in question,

Figure 3 shows in a heavily simplified form a processor included in the control unit with the requisite D/A (digital-analogue) converter,

Figure 4.(1-3) shows a functional flow chart.

**Description of the form of execution referred to in this specification**

Figure 1 shows a theft-impairing device 1 intended for a motor vehicle which uses a voltage feed (+), passing through an ignition lock 2, with appurtenant key 3, a computer-equipped control unit 4 and a code identification unit 5.

Reference number 6 indicates an interface belonging to control unit 4 with code identification unit 5, which has been given the form of a card unit or reader, reference number 7 indicates an interface with a drive unit belonging to the fuel and/or ignition system, which has been given the reference number 8.

From ignition lock 2, current or voltage is fed via line 10 to control unit 4. Via the requisite means in control unit 4 the voltage can be connected further, partly in order via a line 11 to be able to activate a start relay 12a for a starter motor 12, and partly to be able, via line 11, to activate a drive unit 8.

According to the invention, it will only be possible to effect a voltage feed via line 11 after specific conditions have been fulfilled in the control unit.

Card reader 5 can either read a magnetic card 15 or a smart card 16. Alternatively, a personal identification code can be entered via card reader 5 to control unit 4, initiated by a set of push-buttons 17.

Figure 2 shows in principle certain requisite functions and conditions attributed to the computer or processor-equipped control unit 4, and where these functions have a direct connection with the function of theft-impairing device 1 in accordance with the invention.

The intention of Figure 3 is to show how a control unit 4 belonging to processor 31 (CPU) via an input/output interface (I/O) is in contact with a D/A converter, which via a number of outgoing lines can control different functions analogously. Via outgoing lines 36, a contact device 26 can be activated in order to connect lines 10 and 11 together.

The invention is now based on a voltage, through-connected via ignition lock 2 and line 10, being supplied directly to control unit 4. The activated control unit shall in turn supply voltage, at least indirectly, to a starter motor 12 and indirectly to drive unit 8, in order in a known way to control a fuel and/or ignition system for the engine. An important point in connection with the invention in question is the fact that control unit 4 cannot be activated unless control unit 4 has received an approval signal generated by code identification unit 5.

Furthermore, it is necessary that a drive unit 8, in order to control the requisite fuel and/or ignition system, shall be connected via an interface 7 to control unit 4 in order, depending on an activation signal generated in control unit 4, to permit the activation of functions in drive unit 8, and to generate an acknowledgement signal to control unit 4, representing the status of how the activation signal referred to influenced selected functions within drive unit 8.

Figure 1 shows a drive unit 8, and this is assumed to be able to generate the required control signals for the fuel system, connected to line 13, and for the ignition system, connected to line 14.

Drive unit 8 shall contain requisite control functions but it shall only be possible for them to be activated via control unit 4 if an activation signal generated in control unit 4 and executed function of drive unit 8 are checked by control unit 4 through an acknowledgement signal from drive unit 8, so that the necessary function within drive unit 8 only occurs during the period in which the activation signal generated in control unit 4 and a check of the acknowledgement signal received from drive unit 8 are in action.

The removal of an identification card 15, 16 from the code identification unit 5 inhibits the activation signal referred to above.

The identification code, stored on card 15, or alternatively smart card 16, has an equivalent in a memory inside control unit 4 in the form of a PROM memory or, alternatively, a ROM memory.

The software inside control unit 4 senses the identification code received from card reader 5 and makes a comparison against a stored identification code in control unit 4, and in the event of concurrence the activation signal is generated to interface 7.

Since the comparison of identification codes takes place in the software, the opportunity is created for encoding of the identification code.

This means that the identification code on card 15, 16 does not need to be identical to the identification code stored in control unit 4, a feature that makes a procedure with false identification codes impossible.

The consequence of this is that there is no possibility of being able to evaluate the relationship between the identification code on the card and the corresponding identification code inside control unit 4

When a motor vehicle equipped with a theft-impairing device in accordance with the present invention is to be started, the following sequence of events takes place:

- a) Card 15, 16 is inserted into card reader 5, after which the identity code stored on card 15, 16 becomes accessible to control unit 4. If necessary, a supplementary personal identity code can be inserted via keyboard 17 connected, for example, to card reader 5, as shown in Figure 1, to control unit 4. The ignition is switched on via starter key 3, which serves to activate the software in control unit 4, the task of which is to:
- b) check, via interface 6, that card 15, 16 has been correctly inserted into card reader 5,
- c) check that the identification code read off on card 15, 16 concurs or corresponds with the identification code stored in control unit 4,

- d) activate, with an additional turn of ignition key 3, the starter motor with the aid of a control circuit, fed with voltage from control unit 4,
- e) provide interface 7 with the required activation signal which is verified/modified in interface 7 and which activates drive unit 8,
- f) check that drive unit 8 assumes an active and voltage through-connection position in order to be able to supply fuel and/or the ignition system with voltage or current,
- g) approve a returned status or acknowledgement code signifying correct function of drive unit 8 belonging to the fuel and/or ignition system via interface 7 to control unit 4, i.e. establish a handshaking protocol of transmitted and received control signals.

Control unit 4 is furthermore designed in such a way that it cannot carry out and complete its functions as specified in this document unless both the criteria to evaluate the correct identification code for card 15, 16 and the correct acknowledgement terms from drive unit 8 via interface 7 are fulfilled.

Drive unit 8 is also designed in such a way that it cannot carry out and complete its specified functions unless both the necessary voltage supply and the correct activation signal from control unit 4 via interface 7 are obtained.

When the vehicle has started and been driven, the following sequence of events takes place:

Control unit 4 checks (approves or rejects) on a continuous basis that card 15, 16 remains correctly inserted in card reader 5 and that the identification code read off on card 15, 16 concurs with the identification code stored in control unit 4.

Similarly, control unit 4 approves or rejects on a continuous basis a returned status or acknowledgement code for the function of drive unit 8 via interface 7.

If these conditions are met, the software in control unit 4 carries out the functions needed to provide interface 7 with a continuous control signal, which is verified/modified and thereby supplies fuel and/or the ignition system with voltage

and current. Even in this situation, drive unit 8 shall not be able work and generate the necessary control signals without receiving both a control signal from interface 7 and the requisite operational voltage from control unit 4.

Control unit 4 cannot carry out any of its functions unless both identification codes are correct and the approval signal received from drive unit 8 is correct.

The consequence of the procedure outlined above is that when a correct card 15, 16 is removed from card reader 5, even when the engine is running, the identification conditions in the software inside control unit 4 will not have been fulfilled, which means that control unit 4 will not supply interface 7 with a control signal or pass on the supply voltage to the fuel and/or ignition system via drive unit 8.

This procedure will be the same as turning off the ignition in a conventional car and throttling the fuel supply during operation, which means that the engine will stop.

When the ignition is turned off, the following series of events will take place:

The current to control unit 4 will be cut off, which means that the software cannot generate control signals to interface 7 and therefore not maintain the fuel and/or ignition system via drive unit 8 and thereby stop the engine in the normal way.

Since drive unit 8 is controlled by both a voltage supply and by control signals from control unit 4, hot wiring of the vehicle's electrical system is impossible.

In addition it should be observed that when drive unit is fitted with a computer and comparatively complex, it is difficult to evaluate where the software the control signals are checked and executed and where the acknowledgement signals are generated.

For a specialist in this field there would appear to be a number of possibilities.

Figure 2 shows a block diagram of selected functions within control unit 4.

Interface 6 is coupled to a code identification circuit 20 which transmits a coded signal to a comparative circuit 21.

Here, the code on card 15, 16 is compared with a code stored in memory 22.

If the codes concur, an approval signal is transmitted to a monitoring unit 23.

At this stage, with the criterion voltage supply from ignition lock 2 and right code for card 15, 16 satisfied, the system is activated.

After this, further criteria have to be met in order for the system to operate.

Consequently, it is also necessary for unit 23 to sense the initiation of an activation signal for drive unit 8 in a circuit 24 in which the actual generation of the signal takes place in unit 25.

The activation signal from unit 25 passes via line 32 to interface 7 and on to drive unit 8, and when the requisite reconnection and checking has been carried out in drive unit 8, as a result of voltage being fed to line 32, an acknowledgement signal is activated on line 30.

Via a unit 25, signals occurring on line 30 as well as on lines 13, 14 are sensed and a resulting check or acknowledgement signal is allowed to pass via circuit 24 to unit 23.

If all the above conditions are met, together with the condition that voltage is being fed to line 10, unit 23 generates a full connection signal via line 36 to unit 26, and an activation signal to unit 25.

If comparison unit 21 indicates a wrong code and/or if no approved signal is received from unit 25 and/or if there is no acknowledgement signal on line 30, unit 27 is activated in order, via a line, to inhibit generation of the connection and activation signals in unit 23 to units 26 and 25.

Finally, Figures 4.(1-3) show a flow chart adapted to the principles of the invention where the text on the figures gives the directions necessary in order to clearly understand the function.

Furthermore, it should be noted that for practical purposes, control unit 4 can be integrated in drive unit 8.



The invention is not, of course, restricted to the form of execution described above, but can be modified within the framework of the concept of invention, as illustrated in the subsequent patent claims.

**PATENT CLAIMS**

1. A theft-impairing device (1), intended for a motor vehicle, which utilizes an ignition lock (2, 3), a control device (4) and a code identification unit (5), characterized in that a through-voltage connected via the ignition lock (2,3) can be supplied (10) to the control unit (4), which is so arranged, given the fulfilment of certain selected conditions, to supply voltage to at least a starter motor and a drive unit (8), belonging to a fuel and/or ignition system (13, 14) for the engine, the conditions being that the control unit (4) has received and approved a signal generated by the code identification unit (5), that the drive unit (8) belonging to the fuel and/or ignition system is connected to the control unit (4) in order, depending on an activation signal generated in the control unit (4), to allow voltage to be supplied for the activation of functions in the drive unit (8), whereby another of the conditions mentioned is that the control unit (4) has received and approved an acknowledgement that the activation signal mentioned has activated functions inside the drive unit (8).
2. The device of Claim 1 characterized in that the voltage supply to the drive unit (8) only continues for the duration of the activation signal mentioned.
3. The device of Claim 1 or 2 characterized in that the removal of an identification card from the code identification unit (5) inhibits generation of the activation signal.
4. The device of Claim 1 characterized in that a required supply of voltage to the drive unit (8) and a necessary activation signal for correct function of the drive unit (8) are generated in the control unit (4).
5. The device of Claim 1 characterized in that the acknowledgement or acknowledgement signal mentioned, generated by drive unit (8) and transmitted to the control unit (4), represents the status of how the activation signal from the control unit (4) has affected selected functions within the drive unit (8) and which have been verified in the control unit (4).

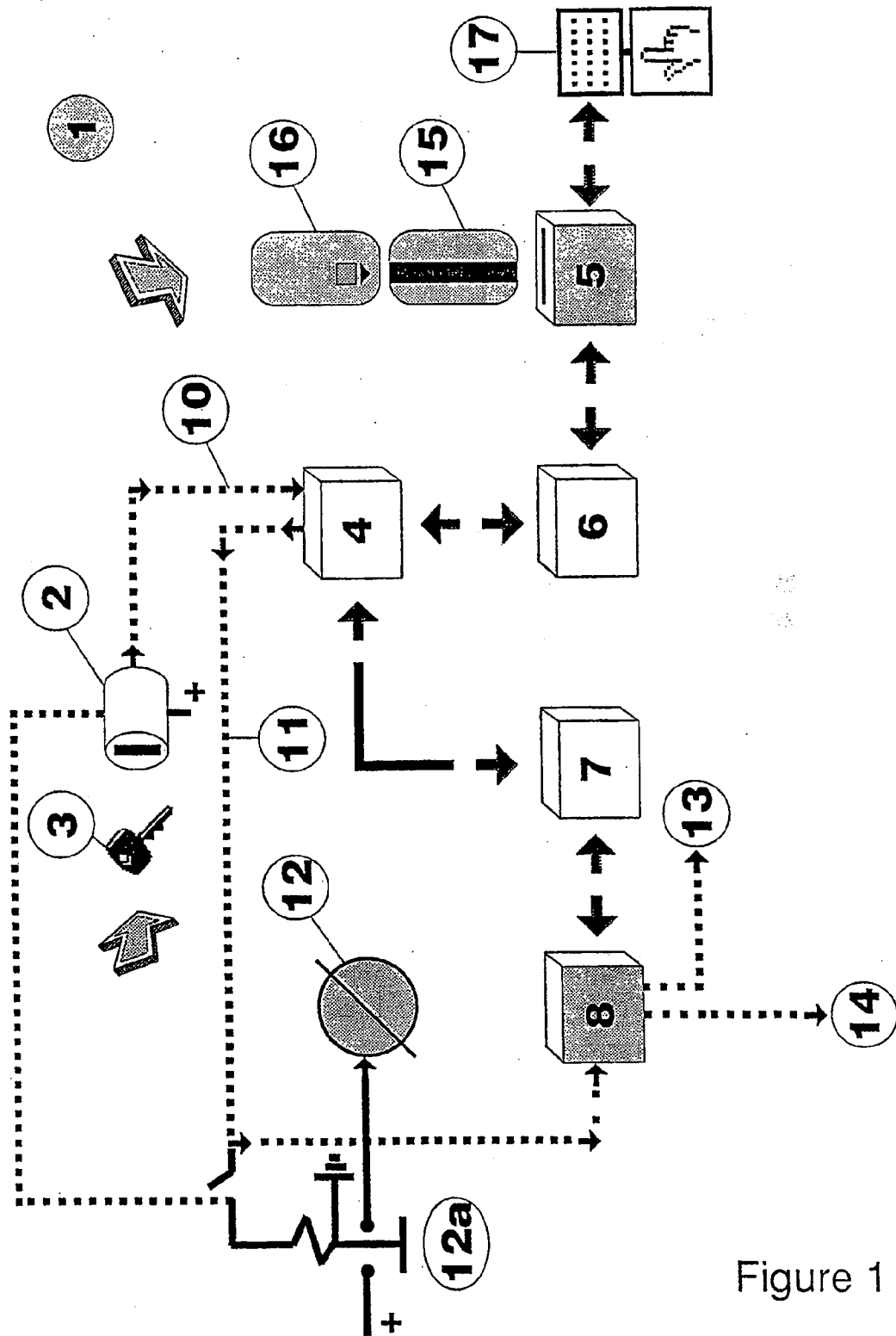


Figure 1

**SUBSTITUTE SHEET**

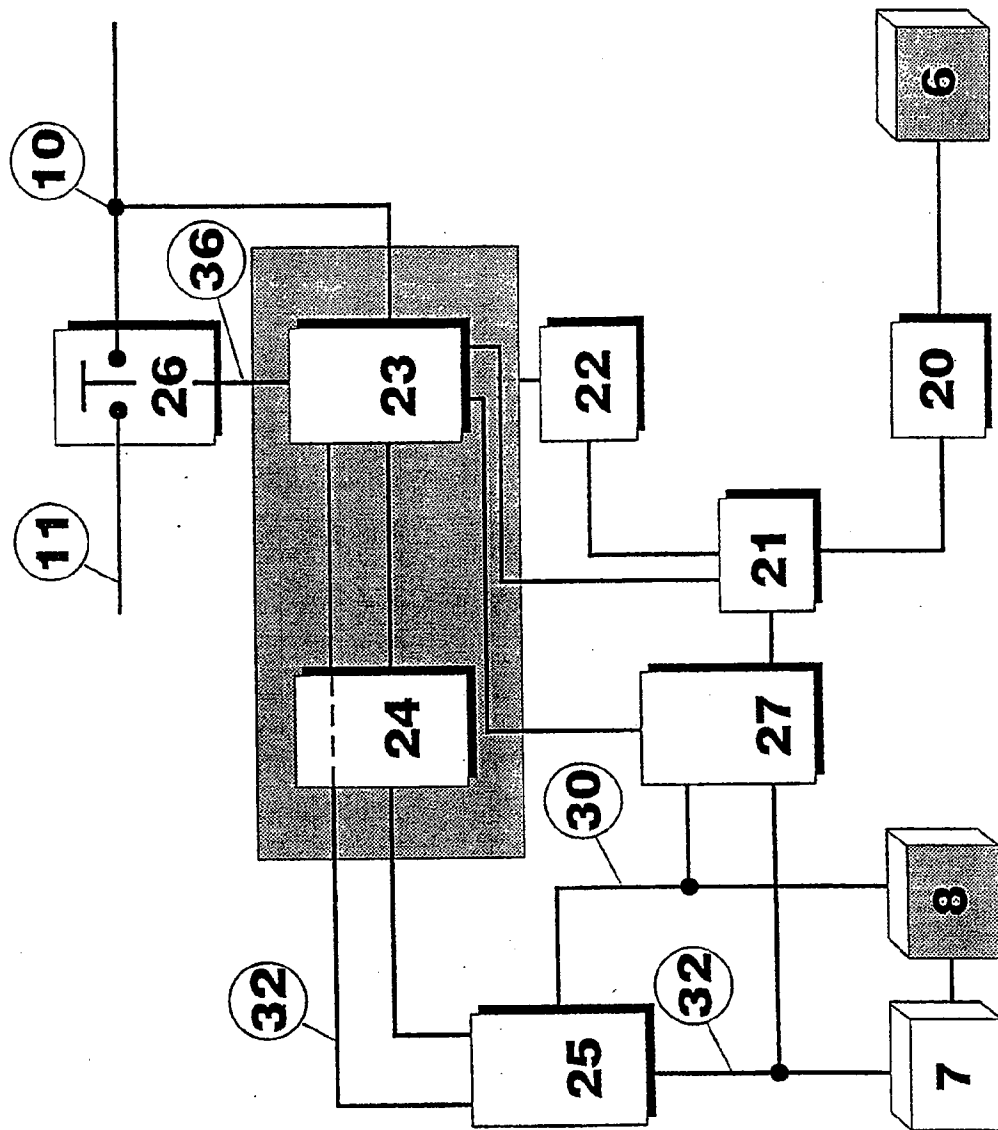


Figure 2

**SUBSTITUTE SHEET**

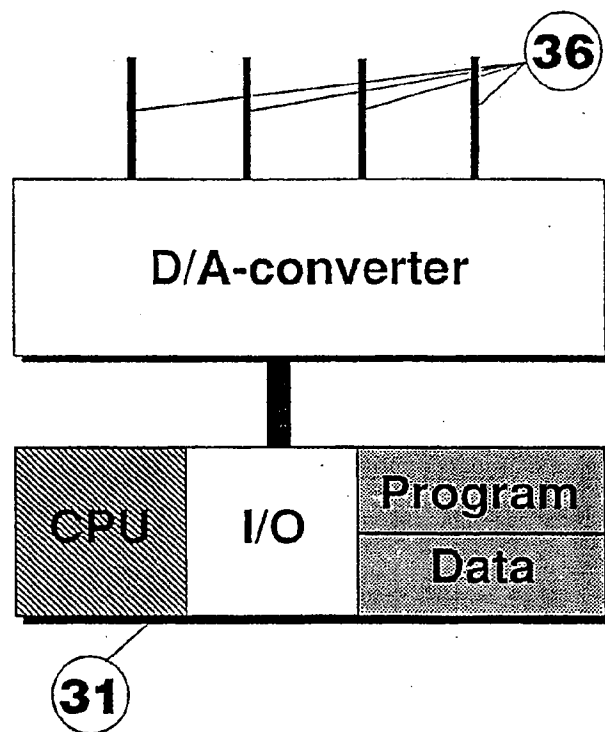


Figure 3

**SUBSTITUTE SHEET**

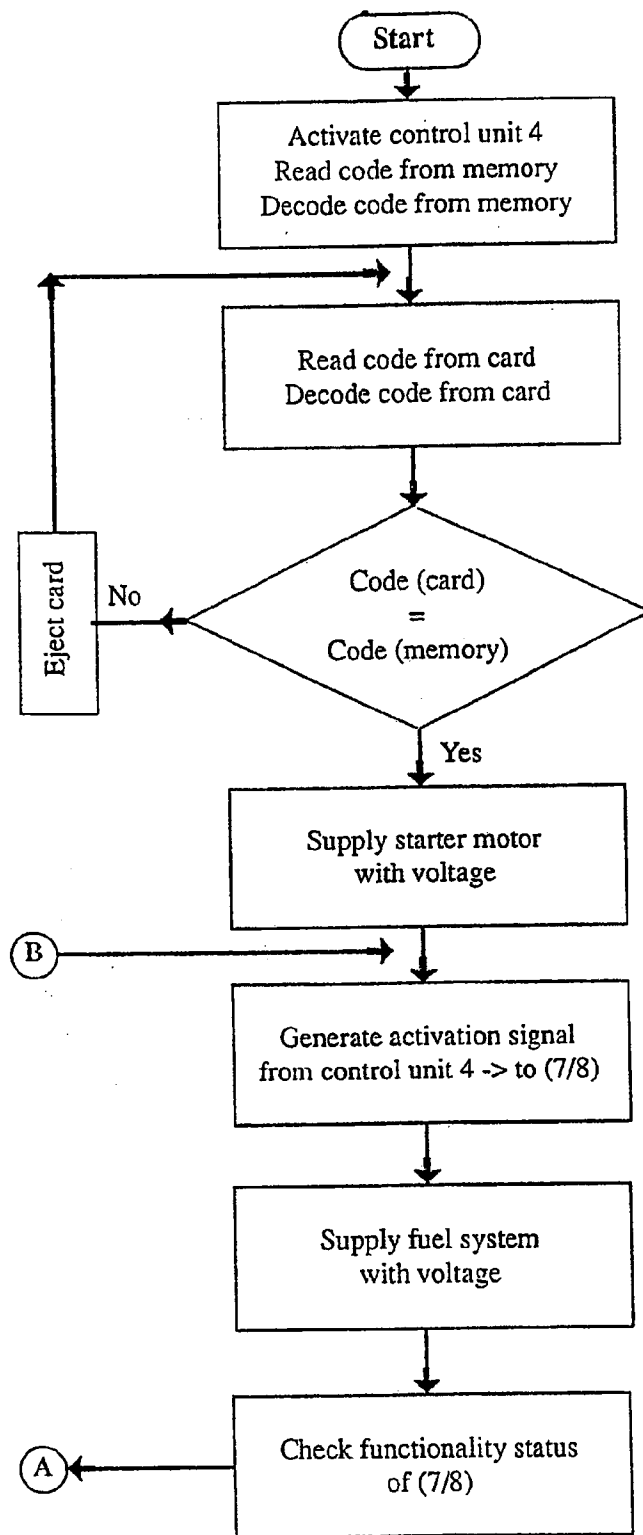


Figure 4.1

**SUBSTITUTE SHEET**

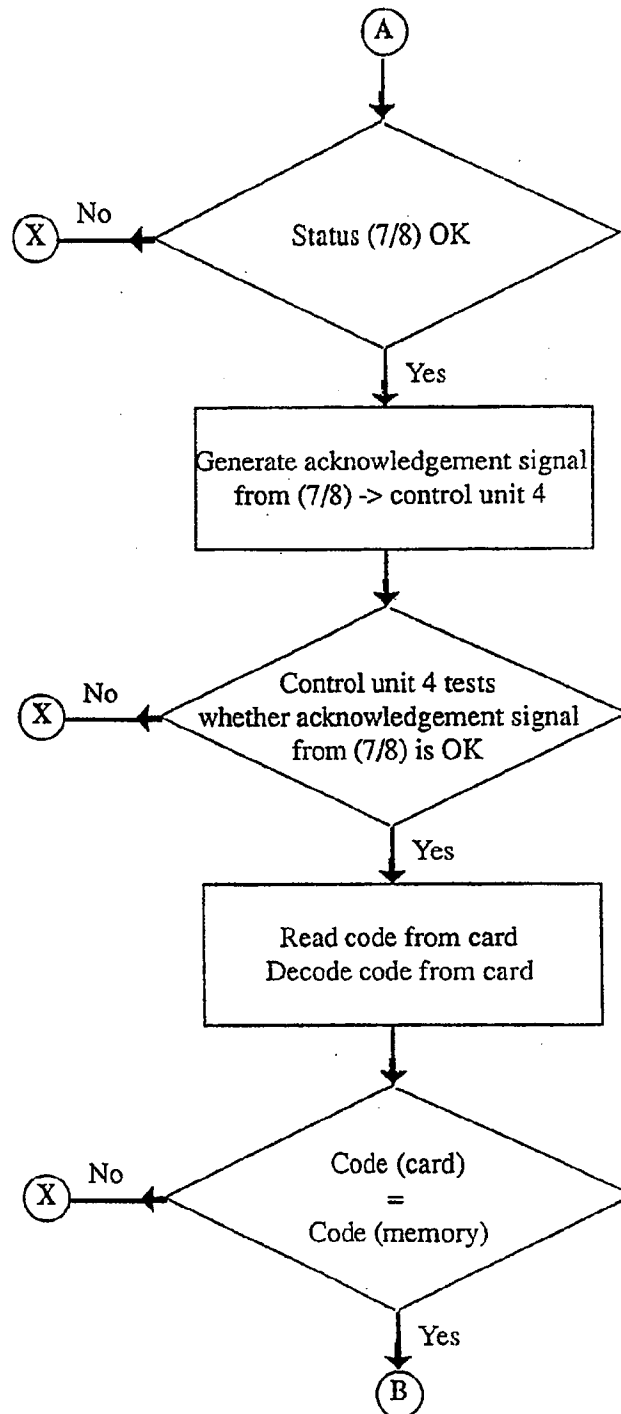


Figure 4.2

**SUBSTITUTE SHEET**

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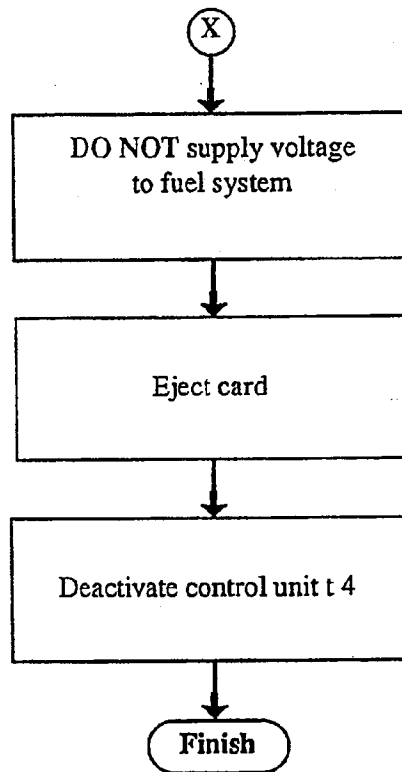


Figure 4.3

**SUBSTITUTE SHEET**



1  
INTERNATIONAL SEARCH REPORT

International application No.

PCT/SE 94/00250

**A. CLASSIFICATION OF SUBJECT MATTER**

IPC5: B60R 25/04

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)

IPC5: B60R

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE,DK,FI,NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPODOC

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

| Category* | Citation of document, with indication, where appropriate, of the relevant passages  | Relevant to claim No. |
|-----------|---|-----------------------|
| Y,P       | WO, A1, 9313966 (OCEAN SOFTWARE LIMITED),<br>22 July 1993 (22.07.93), page 12, line 9 - page 15,<br>line 5                                  | 1                     |
| A         | --  | 2,3                   |
| Y         | GB, A, 2251503 (INTELEPLEX CORPORATION),<br>8 July 1992 (08.07.92), page 4, line 1 - page 5,<br>line 9; page 13, line 26 - page 14, line 24 | 1                     |
| A         | --  | 2,3                   |
| A         | EP, A1, 0456916 (TELETTRA ESPANA, S.A.),<br>21 November 1991 (21.11.91)   | 1-3                   |
|           | --  |                       |

☒ Further documents are listed in the continuation of Box C.

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Date of the actual completion of the international search

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## INTERNATIONAL SEARCH REPORT

International application No.

PCT/SE 94/00250

## C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

| Category* | Citation of document, with indication, where appropriate, of the relevant passages   | Relevant to claim No. |
|-----------|--|-----------------------|
| A         | EP, A2, 0392411 (HITACHI LTD), 17 October 1990<br>(17.10.90), column 11, line 13 - column 13, line 5<br><br>--             | 1                     |
| A         | WO, A1, 8403785 (ERNST, HANS-HELLMUT),<br>27 Sept 1984 (27.09.84), page 1, line 13 - page 4,<br>line 18<br><br>--<br>----- | 1                     |

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**INTERNATIONAL SEARCH REPORT**  
Information on patent family members

28/05/94

International application No.

PCT/SE 94/00250

| Patent document<br>cited in search report | Publication<br>date | Patent family<br>member(s) | Publication<br>date |
|---|---------------------|----------------------------|---------------------|
| WO-A1- 9313966                            | 22/07/93            | AU-A- 3261693              | 03/08/93            |
| GB-A- 2251503                             | 08/07/92            | DE-A- 4123666              | 09/07/92            |
|   |                     | US-A- 5229648              | 20/07/93            |
| EP-A1- 0456916                            | 21/11/91            | NONE                       |                     |
| EP-A2- 0392411                            | 17/10/90            | DE-D- 69006885             | 00/00/00            |
|   |                     | JP-A- 3057751              | 13/03/91            |
|   |                     | US-A- 5091856              | 25/02/92            |
| WO-A1- 8403785                            | 27/09/84            | DE-A- 3308803              | 13/09/84            |
|   |                     | EP-A- 0135583              | 03/04/85            |

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